DATA EVALUATION RECORD

METHOPRENE

STUDY TYPE: Product Performance, OPPTS 810.1100
MRID 45214411

Prepared for

Biopesticides and Pollution Prevention Division
Office of Pesticide Programs
U.S. Environmental Protection Agency
1921 Jefferson Davis Highway
Arlington, VA 22202

Prepared by

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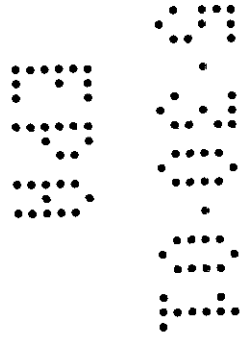
Task Order No. 69



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Reviewed by: **DATA EVALUATION RECORD** 10/22/2001

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STUDY TYPE:	Product Performance, OPPTS 810.1100
MRID NO:	45214411
TEST MATERIAL:	Methoprene
STUDY NO:	2692
SPONSOR:	Wellmark International
TESTING FACILITY:	USDA Grain Marketing and Research Center, Manhattan, Kansas
TITLE OF REPORT:	Residual Efficacy of two Formulations of Methoprene to Control Beetles in Stored Wheat
AUTHOR(S):	F. Arthur
STUDY COMPLETED:	September 7, 2000
CONFIDENTIALITY CLAIMS:	None
STUDY SUMMARY:	Two formulations of methoprene, tested at two temperatures (22 and 32°C), were effective in controlling the F_1 generation of the lesser grain borer (*Rhyzopertha dominica*) and the sawtoothed grain beetle (*Oryzaephilus surinamensis*) on hard red winter wheat after six months storage. F_1 generation adults and pupae of the red flour beetle (*Tribolium castaneum*) were not present in the treated grain; however, larvae were found at levels higher than that in the controls.
CLASSIFICATION:	Supplemental (testing not required by OPPTS)
GOOD LABORATORY PRACTICE	The study did not meet the requirements of 40 CFR part 160 and was not in compliance under Sections: 160.35; 160.47; 160.51: 160.81; 160.63; 160.105; 160.107; 160.195

TEST METHODS

The efficacy of two formulations of Apex in controlling mushroom sciarid flies (*Lycoriella mali*) was evaluated. Commercially prepared compost was spawned with the commercial mushroom *Agaricus bisporus*, filled into 0.25 m^2 plastic trays, pressed and incubated for two weeks at 25°C. The compost was then covered with a mixture of peat moss, lime and casing inoculum. Five days later pinset was initiated by lowering the compost and air temperatures to 20 and 17°C, respectively, decreasing CO_2 content to 0.1% and maintaining relative humidity greater than 85%. The Apex formulations were incorporated into the compost or casing in accordance with three label recommendations; Method A, 175 mL/100 m^2 in casing; Method B, 175 mL/100 m^2 in compost at spawning and 70 mL/100 m^2 in casing; and Method C, 88 mL/100 m^2 on compost before casing and 88 mL/100 m^2 in casing. In additon, the S-isomer was tested in a "new use pattern" in which the Apex was incorporated into the casing material (175 mL/100 m^2), and irrigated onto the casing surface (88 mL/100 m^2) prior to first break (about 13-14 days after casing), or between 1st and 2nd break. A casing only treatment of 88 mL/100 m^2 served as a check. Method A and B were cased 13 days after spawning; Method C was cased 16 days after spawning. Each treatment was replicated six times and the experiment repeated.

Ten or 18 gravid female sciarid flies were placed on the trays which were covered with a fine mesh tent. The tents remained in place until casing. Before 1st generation adult emergence, the tents were replaced and the adult flies were captured on yellow sticky cards. In the "new use pattern" tests, 1st generation flies were not captured but permitted to oviposit on the same tray from which they emerged. In this case emerging 2nd generation adults were captured.

In a second series of tests the efficacy of a granular formulation of Apex was evaluated. Mushroom compost was spawned with *Agaricus bisporis* and placed in 1 L jars. Granular Apex formulations were mixed into the compost at spawning at rates of ½x, 1x and 2x. An untreated compost served as the control. There were six replicates for each treatment. Two granular formulations were tested; 0.2% and 1.5% active. The 1x formulation rates for 0.2% and 1.5% active were 52 kg and 7 kg per 100 m^2 of compost, respectively. Ten adult sciarid flies were placed in each jar at spawning time and the jars werre incubated at room temperature. Sticky pot labels were used to capture emerging adults.

RESULTS SUMMARY

Efficacy was similar for both the R,S racemic mixture and the S isomer formulation within each method of label application, as well as for all three methods of application. Efficacy of post 1st generation application was significantly greater than control when the treatment was applied after the 1st break in the first trial; however, in the second trial, when the flies emerged over a longer period of time, there was no significant difference from control.

In the tests with the granular methoprene formulation, the 1.5% formulation was ineffective in controlling sciarid flies. The 0.2% formulation at the 2x application rate was effective in sciarid control at about the 70% level in the first trial, and both the 1x and 2x rates were effective in the second trial.

The results of the tests were evaluated by statistical analysis. Analyses were conducted on untransformed fly counts or square root transformed counts using the GLM Procedure of SAS. Means were separated using Fisher's Least Significant Difference test at the 5% level.

STUDY AUTHOR'S CONCLUSIONS

The S-formulation of methoprene was as effective as the R,S formulation in controlling mushroom sciarid flies. Efficacy was similar for any method of application. Of the granular formulations, the 1.5% methoprene formulation was ineffective, possibly due to the difficulty in distribution in the compost. The 0.2% formulation was effective at the 2x treatment level in both trials (68 and 70% efficacy), and significant fly control was provided at the 1x treatment level in the second trial (60% efficacy), but not the first.

REVIEWER'S CONCLUSIONS

EPA has waived all requirements to submit efficacy data unless the pesticide product bears a claim to control termites or pests that pose a threat to human health (OPPTS 810.3000). Products designed to control populations of sciarid flies on musroom compost do not appear to fall within those limits.

The test results indicate that the S-formulation of methoprene is as effective as the R,S formulation in controlling mushroom sciarid flies. Of the granular formulations, the 1.5% methoprene formulation was ineffective, and the 0.2% formulation was effective primarily at the 2x treatment level (68 and 70% efficacy). At the 1x treatment level, efficacy was 35 and 60%, and at the 0.5x treatment level, efficacy was 0 and 26%.